Remarks

Claims 20-39 are pending, and claims 20-39 stand rejected. Claim 32 is amended in this response. The Applicants respectfully traverse the rejection and request allowance of claims 20-39.

§ 112 Claim Rejections

The Examiner rejected claims 20-39 under 35 U.S.C. § 112 as being indefinite. The Applicants submit that claims 20-39 are definite under § 112. For claims 20 and 30, the Examiner states it is not clear what structure receives the estimated carbon content factor or the carbon-to-steam ratio. The Examiner further states that it is not clear what structure interconnects with the first flowmeter and the second flowmeter.

The controller is the structure that receives the estimated carbon content factor and the carbon-to-steam ratio. The controller communicates with the first flowmeter and the second flowmeter. We do not have to specify a separate structure, other than the controller, that receives the estimated carbon content factor and the carbon-to-steam ratio for claims 20 and 21 to be definite under § 112. A standard for definiteness is whether "the claims at issue are sufficiently precise to permit a potential competitor to determine whether or not he is infringing." *Exxon Research and Engineering Co. v. United States*, 60 USPQ2d 1272, 1276 (CA FC 2001)(*citing United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942)). The Applicants submit that a competitor would be able to determine whether or not they have a controller that receives an estimated carbon content factor and a carbon-to-steam ratio. Therefore, claims 20 and 30 are definite under § 112.

For claims 21 and 22, the Examiner questions whether "a mass of carbon" is included in "the estimated carbon content factor". The mass of carbon for a constituent of the hydrocarbon feedstock may be one factor used to determine or define the estimated carbon content factor. To answer the Examiner, the mass of carbon is included in the estimated carbon content factor to the extent that the estimated carbon content factor may be based on the mass of carbon of a constituent of the hydrocarbon. Claims 21 and 22 are definite under § 112.

§ 102 Claim Rejections

The Examiner rejected claims 20-25, 28-35, 38, and 39 under 35 U.S.C. § 102 as anticipated by U.S. Patent number 5,458,808 (Suggitt). The Applicants submit that claims 20-25, 28-35, 38, and 39 are novel and non-obvious over Suggitt.

As a background, Suggitt teaches a process for monitoring the hydrocarbon heat content of a feed-gas to keep the heat content at a desired level for a partial oxidation process that generates hydrogen (column 4, lines 52-64). The process uses a partial oxidation unit (18), a shift converter (20), and a hydrogen purification unit (26) (FIGS. 1 and 2) to generate a high purity hydrogen stream (28) (column 7, line 53 to column 8, line 25). To keep the system running efficiently for feed-gases having varying heat contents, an evaluating means (36), flow meters (38), heat content analyzers (32), and valves (42) are used to monitor and adjust the heat content of the feed-gas (see FIG. 1). The evaluating means knows a desired flow rate and heat content for the partial oxidation unit (column 9, lines 46-49). The evaluating means receives a heat content of the feed gas and a flow rate of the feed-gas from the flow meter and heat content analyzer on the feed-gas line (FIG. 1; column 9, lines 61-67). The evaluating means also receives a heat content of the recycled gas stream (30)(the moderator) and a flow rate of the recycled gas stream from the flow meter and heat content analyzer on the recycle gas stream line (FIG. 1; column 9, lines 61-67). Based on the heat contents and the flow rates, the evaluating means adjusts the valves for the feed-gas and the recycled gas stream to maintain the desired heat content and the desired flow rate into the partial oxidation unit (column 11, line 30 to column 12, line 13).

Suggitt does not teach all the claim limitations described in claim 20 of the pending application, as is shown in the following remarks.

(1) Claim 20 describes a controller configured to "receive an estimated carbon content factor, said estimated carbon content factor being based on at least one potential constituent of said hydrocarbon feedstock" and "process said mass flow rate of said hydrocarbon feedstock and said estimated carbon content factor to determine an estimated carbon content of said hydrocarbon feedstock". Suggitt does not teach receiving an estimated carbon content factor or determining an estimated carbon content. The Examiner states on page 6 of the Office Action that Suggitt does not specifically teach receiving an estimated carbon content factor or determining an estimated carbon content of the hydrocarbon feedstock. The Applicants agree

with this assertion. The Examiner further states that because Suggitt produces high purity hydrogen, the system in Suggitt must calculate the amount of carbon contained in the hydrocarbon feedstock. The Applicants disagree with this assertion. The Examiner is reading more into Suggitt than is there to formulate a rejection. The Examiner's rational would be much like saying that because a car engine produces exhaust, all car engines work the same.

Suggitt does not teach determining an estimated carbon content, and such a limitation cannot be inferred merely because the system in Suggitt produces high purity hydrogen. Suggitt teaches receiving a heat content and flow rate of a feed gas and a heat content and flow rate of a recycle gas into an evaluation means (FIG. 1; column 9, lines 61-67). Based on the heat contents and the flow rates, the evaluating means adjusts valves to maintain the desired heat content and the desired flow rate into the partial oxidation unit to produce high purity hydrogen (column 11, line 30 to column 12, line 13). It is the heat content and the flow rates that Suggitt is concerned with, not an estimated carbon content of the hydrocarbon feedstock.

Also, Suggitt does not teach determining an estimated carbon content factor, and such a limitation cannot be inferred merely because the system in Suggitt produces high purity hydrogen. Suggitt does not teach an estimated carbon content factor based on at least one potential constituent of the hydrocarbon feedstock. Suggitt does list some potential components of the feed-gas (*see Suggitt,* column 5, lines 39-41), but Suggitt does not teach that an estimated carbon content factor is based on one of the potential components.

(2) Claim 20 describes a controller configured to "receive a carbon-to-steam ratio for said hydrogen production system, and to process said estimated carbon content of said hydrocarbon feedstock, said flow rate of said steam, and said carbon-to-steam ratio to control at least one of said flow rate of said steam and said flow rate of said hydrocarbon feedstock." Suggitt does not teach receiving a carbon-to-steam ratio or controlling based on a carbon-to-steam ratio. The Examiner on pages 6 and 7 of the Office Action states that Suggitt teaches determining a carbon-to-steam ratio and teaches controlling a flow rate based on the carbon-to-steam ratio. The Applicants disagree with this assertion. The Office Action further states that the flow rates are continually evaluated and adjusted in Suggitt.

The flow rates are continually evaluated and adjusted in Suggitt. However, what properties are evaluated to adjust the flow rates? The evaluation means in Suggitt looks at a heat

content and flow rate of a feed gas, and a heat content and flow rate of a recycle gas to produce high purity hydrogen (column 9, line 61 to column 10, line 23). Suggitt does not teach considering a carbon-to-steam ratio.

Suggitt does not teach actively using a carbon-to-steam ratio and such a limitation cannot be inferred merely because the system in Suggitt produces high purity hydrogen. Once again, the Examiner is reading more into Suggitt than is there to formulate a rejection. Suggitt teaches a partial oxidation process where the heat content needs to be evaluated, not a carbon-to-steam ratio. Therefore, Suggitt does not teach using a carbon-to-steam ratio.

The above remarks illustrate that claim 20 is new and non-obvious in view of Suggitt. The above remarks apply equally to claim 30.

§ 103 Claim Rejections

The Examiner rejected claims 26, 27, 36, and 37 under 35 U.S.C. § 103 in view of Suggitt and U.S. Patent number 5,259,239 (Gaisford). The remarks provided above apply equally to this rejection. The Applicants submit that claims 26, 27, 36, and 37 are novel and non-obvious over Suggitt, Gaisford, and any combination thereof as being dependent on a novel and non-obvious independent claim.

Conclusion

Based on the above remarks, the Applicants submit that independent claims 20 and 30 are allowable. The dependent claims are allowable as being dependent on an allowable independent claim. There may be additional reasons in support of patentability, but such reasons are omitted in the interests of brevity. We respectfully request allowance of claims 20-39.

Any fees may be charged to deposit account 502622.

Respectfully submitted,

Date: 8-15-03

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